



MAY 28 2010

10CFR50.73

LR-N10- 0197

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington DC 20555-001

Supplemental LER 311/10-002-01  
Salem Nuclear Generating Station Unit 2  
Facility Operating License No. DPR-75  
NRC Docket No. 50-311

SUBJECT: Automatic Reactor Trip Due to 21 Steam Generator Feedwater Pump Trip  
and Steam Generator Low Level

This Supplemental Licensee Event Report, "Automatic Reactor Trip Due to 21 Steam Generator Feedwater Pump Trip and Steam Generator Low Level," is being submitted pursuant to the requirements of the Code of Federal Regulations 10 CFR 50.73 (a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

The attached Supplemental LER contains no commitments. Should you have any questions or comments regarding this submittal, please contact Mr. Brian Thomas at 856-339-2022.

Sincerely,

A handwritten signature in black ink, appearing to read "CJ Fricker", written over a horizontal line.

Carl J. Fricker  
Site Vice President - Salem

Attachments (1)

IE22  
NRA

MAY 28 2010

cc Mr. S. Collins, Administrator, Region I, NRC  
Mr. R. Ennis, Licensing Project Manager – Salem, NRC  
Mr. D. Schroeder, USNRC Senior Resident Inspector, Salem (X24)  
Mr. P. Mulligan, Manager IV, NJBNE  
L. Marabella, Corporate Commitment Tracking Coordinator  
H. Berrick, Salem Commitment Tracking Coordinator

**MAY 28 2010**

Bcc: President and Chief Nuclear Officer  
Vice President Operations Support  
Director – Nuclear Oversight  
Director – Regulatory Affairs  
Plant Manager – Salem  
Regulatory Assurance Manager – Salem  
Licensing Manager  
NSRB  
INPO at LEREvents@inpo.org

NRC FORM 366 (9-2007)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0104		EXPIRES: 08/31/2010	
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2>				<small>Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.</small>			
1. FACILITY NAME Salem Generating Station - Unit 2				2. DOCKET NUMBER 05000311		3. PAGE 1 of 4	
4. TITLE Automatic Reactor Trip Due to 21 Steam Generator Feedwater Pump Trip and Steam Generator Low Level							
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY
01	21	2010	2010	0 0 2	1	05	28
			8. OTHER FACILITIES INVOLVED				
			FACILITY NAME				DOCKET NUMBER
							DOCKET NUMBER
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)				
1			<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii)				
			<input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(A)				
10. POWER LEVEL			<input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(viii)(B)				
			<input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(ix)(A)				
78			<input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(x)				
			<input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(4)				
			<input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 73.71(a)(5)				
			<input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> OTHER				
			<input type="checkbox"/> 20.2203(a)(2)(vi) <input type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D)				
			Specify in Abstract below or in NRC Form 366A				
12. LICENSEE CONTACT FOR THIS LER							
FACILITY NAME Brian Thomas, Senior Compliance Engineer						TELEPHONE NUMBER (Include Area Code) (856) 339 -2022	
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT							
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	REPORTABLE TO EPIX
14. SUPPLEMENTAL REPORT EXPECTED						15. EXPECTED SUBMISSION DATE	
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO						MONTH	DAY
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)							
<p>On January 21, 2010, at 1818 hours, the 21 Steam Generator Feedwater Pump (SGFP) tripped. A turbine runback automatically initiated as expected and steam generator level in all four Steam Generators (SG) continued to lower. The 22 SG reached the SG low level reactor trip setpoint at 1820 hours resulting in an automatic reactor trip. All control rods fully inserted on the trip. All three Auxiliary Feedwater (AFW) pumps started in response to the low SG water level and decay heat was removed by the steam dumps to the main condenser. Operators entered the emergency procedures for the plant trip and stabilized the plant in Mode 3 (HOT STANDBY).</p> <p>The cause of the 21 SGFP trip was an internal wiring short in the SGFP trip control circuit that resulted in a false low suction pressure trip signal. The cause for the wiring short was the result of poor work practices. The reactor tripped on low water level in the 22 SG as designed. Corrective actions consist of lug inspections, document changes, training analysis, and evaluation of the integrated plant response to a SGFP trip from full power and implementing changes as appropriate.</p> <p>This report is made in accordance with 10CFR50.73 (a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."</p>							

## LICENSEE EVENT REPORT (LER)

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## NARRATIVE

**PLANT AND SYSTEM IDENTIFICATION**

Westinghouse – Pressurized Water Reactor (PWR/4)

Auxiliary Feedwater System {BA/-}  
Main Feedwater System {SJ/-}

\* Energy Industry Identification System {EIS} codes and component function identifier codes appear as {SS/CCC}

**IDENTIFICATION OF OCCURRENCE**

Event Date: January 21, 2010

Discovery Date: January 21, 2010

**CONDITIONS PRIOR TO OCCURRENCE**

Salem Unit 2 was in Mode 1 (POWER OPERATION) at approximately 78% reactor power when the automatic trip occurred. Prior to the reactor trip a turbine runback was in progress due to the trip of the 21 Steam Generator Feedwater Pump (SGFP). There was no equipment out of service that impacted this event.

**DESCRIPTION OF OCCURRENCE**

On January 21, 2010, at 1818 hours, the 21 Steam Generator Feedwater Pump (SGFP) {SJ/P} tripped. A turbine runback automatically initiated as expected and steam generator level in all four Steam Generators (SG) continued to lower. The 22 SG reached the SG low level reactor trip setpoint at 1820 hours resulting in an automatic reactor trip. All control rods fully inserted on the trip. All three Auxiliary Feedwater (AFW) pumps {BA/P} started in response to the low SG water level and decay heat was removed by the steam dumps to the main condenser. Operators entered the emergency procedures for the plant trip and stabilized the plant in Mode 3 (HOT STANDBY).

This report is being made in accordance with 10CFR50.73 (a)(2)(iv)(A), "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)."

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**CAUSE OF OCCURRENCE**

The cause of the 21 SGFP trip was an internal wiring short in the SGFP trip circuit that resulted in a false low suction pressure trip signal. The short circuit occurred due to the barrel of the lug for the normally closed contact coming in contact with the terminal screw of the normally open contact resulting in failure of the electrical insulation on the barrel. The cause for the wiring short was the result of poor work practices.

The reactor tripped on low water level in the 22 SG as designed. The low level SG trip setpoint as evaluated in the accident analysis is set at a level to ensure that adequate heat removal is maintained following a loss of normal feedwater. To increase the reliability of plant operations in response to a trip of a single SGFP, Salem installed an automatic plant runback feature in the 1990s. This feature is not credited in the accident analysis. Testing and evaluation following the 22 SG low level reactor trip determined that the systems responding to the loss of a single SGFP operated as designed but did not prevent the reactor trip from occurring.

**PREVIOUS OCCURRENCES**

A review for LERs for the past 3 years did not identify any prior similar occurrences related to improper lug installation. LER 311/2007-002-00 identified a reactor trip due to a breach in the condensate system which resulted in the trip of the 21 SGFP, a turbine runback and reactor trip as a result of low level in the 22 SG. The corrective actions were specific to the demineralizer vessel sight glass failure which caused the 21 SGFP trip.

**SAFETY CONSEQUENCES AND IMPLICATIONS**

There were no safety consequences associated with this event. All safety related equipment functioned as designed in response to this event and the plant was stabilized in Mode 3 in accordance with plant operating procedures. The plant runback in response to a SGFP trip is not credited in the accident analysis, the accident analysis evaluates the loss of all feedwater which is mitigated by a reactor trip on low steam generator water level and actuation of the auxiliary feedwater system which functioned appropriately during this event.

A review of this event determined that a Safety System Functional Failure (SSFF) as defined in NEI 99-02, Regulatory Assessment Performance Indicator Guidelines, did not occur since the ability to remove residual heat and mitigate the consequences of an accident were maintained.

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### CORRECTIVE ACTIONS

1. Repaired the damaged insulation and wiring in the 21 SGFP trip control circuit.
2. Performed an extent of condition inspection on the remaining Unit 2 SGFP panels for insulation degradation similar to the 21 SGFP and did not identify any deficiencies.
3. Completed a root cause evaluation and determined that improper lug orientation, not damaged insulation, directly caused the internal wiring short and additional inspections were required to prevent shorting across the terminal screws. The Unit 1 SGFP pressure switches were inspected during the 1R20 refueling outage in April 2010 for proper lug orientation. The Unit 2 SGFP pressure switches will be inspected for proper lug orientation during the next refueling outage in the Spring of 2011.
4. Appropriate documents will be revised to clarify the guidance for lug installation and a training analysis will be performed to determine any necessary changes to the training program.
5. Testing and evaluation have determined that the systems responding to the loss of a single SGFP were operating as designed. An evaluation of the integrated plant response to a SGFP trip from full power will be performed and changes will be implemented as appropriate.

### COMMITMENTS

No commitments are made in this LER.